

Appl. No. 09/845,561 Amdt. dated March 5, 2004 Reply to Office Action of March 1, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

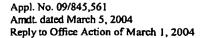
Please cancel claims 25, 26, 29, and 30 without prejudice.

1. (original): A method of modeling phenomena comprising the steps of: creating a set of tags, each tag controlling one or more aspects of one or more phenomena;

arranging selected members of the set of tags in a desired sequence to produce phenomena as defined by the sequence of tags; and

processing the tags in order to produce phenomena having the characteristics defined by the tags.

- 2. (original): The method of claim 1 wherein the phenomena controlled by the tags are characteristics of speech, wherein the step of arranging selected members of the tags in a desired sequence comprises placing the selected members of the set of tags into a body of text and wherein the step of processing the tags comprises processing the body of text and the tags to produce speech having characteristics defined by the tags.
- 3. (original): The method of claim 2 wherein the characteristics of speech are prosodic characteristics of speech.
- 4. (original): The method of claim 3 wherein each tag imposes a constraint on the prosodic characteristics of speech affected by the tag.



- 5. (original): The method of claim 4 wherein each of the tags specifies an action to be taken and includes parameters defining attributes and associated values providing information about the action to be taken.
- 6. (original): The method of claim 5 wherein each of the tags may include a parameter specifying the location at which the tag takes effect.
- 7. (original): The method of claim 6 wherein the set of tags includes tags which establish settings which remain unchanged until altered by a subsequent tag.
- 8. (original): The method of claim 7 wherein the set of tags includes members which define the pitch behavior of speech over the course of a phrase.
- 9. (original): The method of claim 8 wherein the set of tags includes tags defining accents which define the pitch behavior of local influences within a phrase.
- 10. (original): The method of claim 6 wherein the set of tags includes tags defining phrase boundaries which mark boundaries between regions at which tags have effect.
- 11. (original): The method of claim 10 wherein a tag which defines a phrase boundary prevents tags following the tag which marks the boundary from influencing speech components preceding the tag which marks the boundary.
- 12. (original): The method of claim 9 wherein each of the tags may include values defining type and strength in order to define interaction of the tag with other tags.
- 13. (original): The method of claim 12 wherein a tag may compromise its shape, average pitch or both depending on the value defining type.



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- 14. (original): The method of claim 8 wherein the step of processing the tags includes establishing a phrase curve by creating and solving equations defined by tags which specify changes in pitch and tags which specify rates of changes in pitch.
- 15. (original): The method of claim 14 wherein the body of text and the tags are processed one minor phrase at a time.
- 16. (original): The method of claim 15 wherein processing of a phrase includes using values describing properties prevailing near the end of an immediately preceding phrase.
- 17. (original): The method of claim 9 wherein the step of processing the tags includes establishing a pitch curve by creating and solving equations defined by tags which specify accents.
- 18. (original): The method of claim 17 wherein the body of text and the tags are processed one minor phrase at a time.
- 19. (original): The method of claim 18 wherein processing of a phrase includes using values describing properties prevailing near the end of an immediately preceding phrase.
- 20. (original): A method of processing a body of text including tags defining prosodic characteristics of speech to be produced by processing the text, comprising the steps of: extracting the tags from the text;

creating a set of equations defining a phrase curve;

solving the set of equations to produce the phrase curve;

creating a set of equations defining a pitch curve;

solving the set of equations to produce the pitch curve:



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mapping linguistic concepts represented by the phrase curve and the pitch curve to acoustical observables; and

performing a nonlinear transformation to adjust the prosodic characteristics defined by tags to human perceptions and expectations.

21. (original): A method of defining a set of tags specifying prosodic characteristics of a target speaker, comprising the steps of:

selecting a body of training text;

receiving speech representing reading of the training text by the target speaker to form a training corpus;

analyzing the training corpus to identify prosodic characteristics of the training corpus;

creating a set of tags defining the identified prosodic characteristics of the training corpus.

22. (original): A method of placing tags in text for text to speech processing comprising the steps of:

placing tags in a body of training text to model prosodic characteristics of a training corpus produced by reading of the training text;

analyzing the placement of the tags in the training text to develop a set of rules for placement of tags in text; and

applying the rules to text for which text to speech processing is desired to place tags in the text in order to produce speech having desired prosodic characteristics.



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23. A text to speech system for receiving text inputs comprising text to (original): be processed to generate speech and tags defining prosodic characteristics of the speech to be generated, comprising:

a text input interface for receiving the text input;

a speech modeler operative to process the text inputs to produce speech having the prosodic characteristics specified by the tags; and

a speech output interface for producing the speech output.

- 24. (original): The system of claim 23 wherein the speech modeler is further operative to process a training corpus representing a reading of text by a target speaker to produce tags defining prosodic characteristics of the training corpus and use the tags to produce speech having prosodic characteristics typical of the target speaker.
 - 25. (canceled)
 - 26. (canceled)
- 27. The method of claim 2 wherein each tag imposes a constraint on (original): motion of an articulator used to produce speech.
- 28. The method of claim 1 wherein each tag imposes a constraint on (original): modeled muscular motions used to simulate gestures or facial expression.
 - 29. (canceled)
 - 30. (canceled)
- 31. (original): The method of claim 9 wherein one or more tags are placed within a proper noun comprising two or more words, each such tag producing prosody indicating to a



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listener that the proper noun is to be interpreted as a single entity rather than as more than one entity.

- 32. (original): The method of claim 31 wherein the tag produces an increase in the pitch and speed of speech over the speech affected by the tag.
- 33. (original): The method of claim 9 wherein one or more tags are placed to produce a word having prosody indicating that the word requires confirmation.
- 34. (original): The method of claim 33 wherein the prosody indicating that the word requires confirmation is characterized by a relatively high and increasing pitch across the word requiring confirmation.